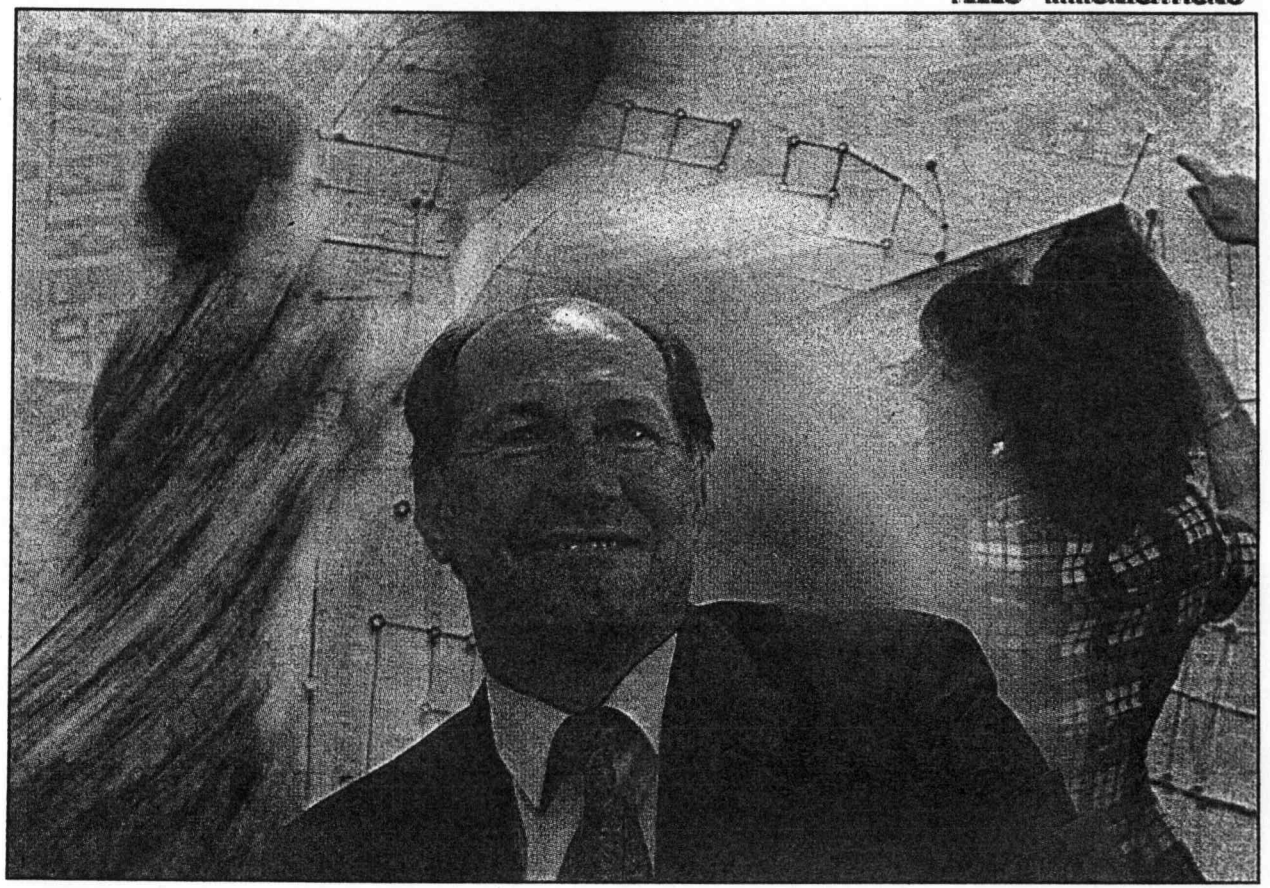
Power companies appear to be taking the new technologies to their limits, reports STEWART FRASER

Energising the air waves



Gerry Carlton: "The point is to be able to have our load management as flexible as possible"

THE modern application of telecommunications seems to have no limitations. It can cover voice, data and telecontrol systems. Consider Scottish-Power, for example. Among its uses of telecommunications is the application of modulation of a radio wave - on Radio 4 as it happens - to control the charge going into domestic storage heaters.

It takes place in the background, without consumers being aware of it or indeed being directly affected in any way. It brings reduced tariffs for those agreeing to take part in using the radio tele-switching system and it cuts down the costs of generation for the electricity supply company into the bargain.

Yet, as Gerry Carlton, engineering manager in the telecommunications division of ScottishPower, points out, it's by no means a novel idea.

"The actual application of this idea goes back to before the last war, when the British Electrical Authority was setting up the National Grid system and local or municipal undertakings were the operators. Everyone was

"There used to be time-clocks as the prime control. The instruments would have to be reset on occasions, and calibrated, and checked out.

"There were other ideas of what to do. The BBC, for example, had a system using their long wave to send out data to control radio transmitters.

"They entered a consortium of various parties to install radio teleswitches, where a charge going into storage heaters could be set as a fixed period, but the time could be altered by using radio signals.

"The point is to be able to have our load management as flexible as possible. If the economy bucks up, and companies introduce an extra shift, there is an extra load. We have to respond to that. If an international football match is on the telly there can be a sudden extra load - what we call a telly pick-up - when everyone decides to make a cup of tea at the same time, and so on.

"We might have to bring on additional generating capacity, which has a cost implication. Or we might have a unit standing by, spinning

at the same time, and the tea-time domestic load is added to the business load already in use - can be predicted reasonably accurately day by day. The radio tele-controlled load is scheduled to fit in between. There is a benefit to ourselves, and we can pass that on to the consumer with a tariff down to

6 If an international football match is on the telly there can be

costs and gives environmental benefits.

"In our view, it is really a win-win situation for both parties."

By 1988, there were some 32,000 radio tele-switches in use. Today, the figure is around 150,000, the great majority for domestic consumers, with some industrial and commercial applications. The use of time switches as such has been greatly reduced over the years.

With the total load under radio tele-

the weather changes. The charge needed does not have to be sent out at one period and spreading the load in this way also makes for a more efficient operating system.

Many local authority tenants have Weathercall as part of a heat-with-rent agreement, where fixed monthly payments cover the cost of both aspects.

The actual signals sent out are at 198 kHz, not using the sound waves of radio amplitude modulation, but

seeking to meet a common load and there was remote control in use in the Borders as a start to this idea of telecommunications," he says.

"There is, in fact, a large amount of experience in this area of operation within ScottishPower and our predecessor company, SSEB. Customers have for many years had the offer of using off-peak electricity, perhaps under the White Meter scheme, all based on a system of a charge being put into storage heaters and for hot water for a certain number of hours at a given tariff.

away, but not actually being used, in case it is needed, and that has a cost implication also.

"However, if we can meet extra load, by simply ceasing for a short time to put the charge into storage heaters, for example, that is a simple solution.

"It does not affect the domestic customer, for the charge will continue after a short break. The total supplied is still correct and the heat will be available when the customer wants it, some time later.

"In practice, the main load peaks - for example, when two things happen

the telly there can be an extra load ?

some 2.79p per unit and a 2 per cent discount available at present into the bargain.

"It is a simple idea. Essentially, a signal goes from a ScottishPower control centre to the BBC control centre. A signal goes out on long-wave radio transmission. That goes to receivers set to a particular code. It switches storage heating load on or off and nothing else. It cuts generation

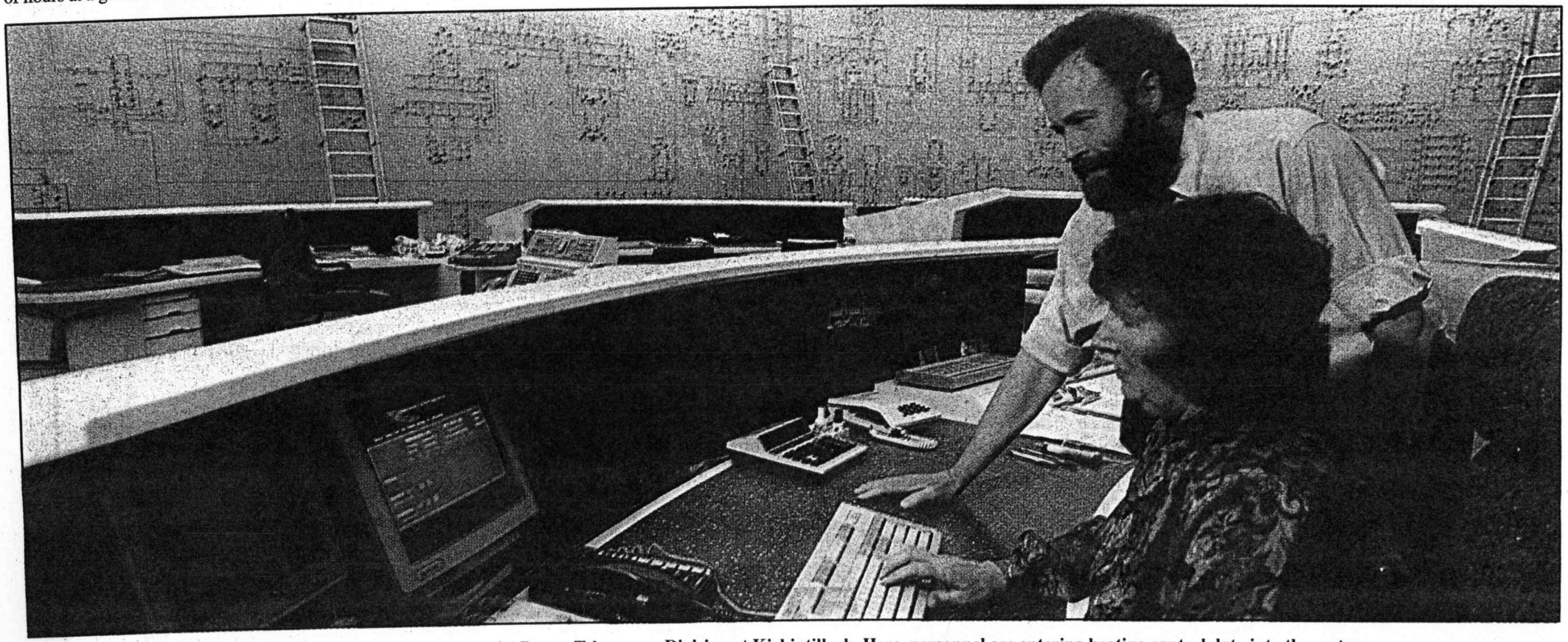
switching control now around 800MW, the potential for any problems in meeting unexpected or extra load at any time is much reduced. A typical modern large generation unit is around 600MW. Using the pumped storage system at Cruachan could provide a load of up to 300MW. Using radio tele-switching saves having to bring an extra unit or pumped storage capacity into operation.

Current practice in Scottish Power includes use of their Weathercall system, whereby the amount of charge put into a storage system is varied as

radio amplitude modulation, but suitable phase modulation. In other words, no Radio 4 broadcast goes into the domestic storage radiator. There is no broadcast to be heard unexpectedly in the consumer's home.

In similar vein, the electricity supply company is not responsible for causing any inadvertent switching of radio programmes on or off. It is more a case of fine tuning power-load at any time, smoothing out peaks and hollows in the power demand graphs.

Perhaps Scottish Power could take a bow for being smooth operators, in the best sense of the term.



Inside the control centre at the ScottishPower Telecomms Division at Kirkintilloch. Here, personnel are entering heating control data into the system